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ABSTRACT

An electronic performance support system (EPSS) is a computerized system designed to increase productivity by supporting the performance of the worker on demand at the time of need. This way, workers are allowed to perform with a minimum of intervention from others. Popular examples of performance support tools, or partially implemented EPSSs, include the personal computer "wizards" whose assistance in creating a database, spreadsheet, document, or presentation results in a finished product rather than simply a user tutorial. An integrated performance support system, or a fully implemented EPSS, can provide even more: expert knowledge, searchable references and data, granular training like cue cards, and automated tools. A EPSS project begins with commitment to needs assessment and project support, cooperation between subject experts and designers, the skills of a multidisciplinary team, and a well-considered plan as to whether the system will be built from scratch or wrapped around an existing application. When marketing an EPSS, one must convince the organization that it will solve current performance problems, and that the level of support and the timing are optimal. Planning stages involve establishing project scope, reviewing organizational goals and needs, making sure the project team fully understands the reason for the EPSS, and creating mechanisms for reporting on progress. The next step is specification analysis, which involves feasibility studies, focus groups, task analysis, developing functional specifications, and choices of hardware and software. The results of the analyses are presented to the client, and if he or she decides to proceed with an EPSS, then the team can develop a maintenance strategy, prepare a development plans, and then actually build the system. Building includes developing the interface, the metaphor for the desktop, and data structure; it also comprises design and prototype, and procurement and integration of content into the system. Then the EPSS must be installed and systematically evaluated, with the team all the while alert to bio-factors in the work environment, like any dehumanizing effects of the system. (BEW)

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Electronic Performance Support Systems (EPSS): Making The Transition

By Susan Des Jardins and Harry Davis, Jr.

Understanding EPSS

EPSS is the buzzword for the nineties. Suddenly everyone is a PT (Performance Technologist). Some developed IPS's (Integrated Performance Support) and others have developed PST's (Performance Support Tools). No matter what term you use, they all relate to EPSS (computer-based just-in-time support during the performance of your work). Make sure you understand the concept.

Performance support comes in a variety of flavors. Most good training supports performance whether it's instructor-led or interactive multimedia training. So when we discuss performance support and EPSS, are we saying the same thing as training? Not really.

When talking about EPSS, one typically means a computerized system designed to support the actual performance of the worker at the time of need. EPSS's allow workers to perform with a minimum of support and intervention from others. This support is available on demand as the job is done and results in completed work.

An EPSS improves performance by increasing productivity. Employees receive job task support while working. An EPSS can teach through the "learn by doing" method of training, but it is not the same as traditional CBT. An EPSS may contain context sensitive granular training, but that is only a part of an entire support system.

There are few examples of fully developed performance support systems, but Gloria Gery's book, Electronic Performance Support Systems, describes various examples of support systems that companies have developed. Popular examples of performance support tools include Microsoft's Wizards in Access, Excel, Word, or PowerPoint. Wizards help you create a database, spreadsheet, document, or presentation resulting in the actual product rather than just telling or teaching you about it. You learn by doing it.

IPSS and PST: What's the Difference

It's important to distinguish between an **integrated performance sup-**

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port system (a fully implemented EPSS) and a **performance support tool** (a partially implemented EPSS). Both are valid, both are useful, but the scope is different. Make sure you are clear about which you are building before you begin.

An **integrated performance support system** provides any combination of these or other components. The more components the better the support:

- expert knowledge (advice & coaching)
- searchable references and data
- granular training (cue cards and explanations)
- automated tools (interest calculations, spreadsheets, templates, or job aids such as sales tax charts).

A **performance support tool** is typically just one or a few of the components listed above. Some examples of performance support tools are Will Maker and Trust Maker by Nolo Software or Turbo Tax by Quicken. These products have a conversational interface which asks users questions and then produces a will, a trust, or your income tax return. The user does not have to know exactly why the questions are being asked or how the information is being used, as long as it is made into a final product.

Building an EPSS: Commitment

An EPSS project is an undertaking that requires crucial support from the client's organization. Just as a needs analysis is important for training, it is even more important for EPSS development.

- You need a commitment for the needs analysis and for project support. Support should begin at the top. Executives must provide commitment and encouragement (monetary and verbal) for the project.
- Corporate subject matter experts must cooperate with the design team.
- The designated users of the EPSS must provide input and be involved with the design of their product.

It is important to identify the roles and responsibilities of all involved to ensure the success of the project.

Building an EPSS: Skill Set

As trainers, instructional designers and, especially, multimedia developers, you probably have the skill set needed to design and manage an EPSS development effort. Your skills in needs analysis, design, development, implementation, and evaluation are the main components of EPSS development. If your technical skills are as strong as your design skills, then you are in an even better position.

However, EPSS development requires a multidisciplinary team for proper system design, maximum efficiency, and speed. It should consist of instructional designers to ensure proper objectives, functionality, and solutions; subject matter experts for content integrity; application architects (multimedia and graphics); and programmers.

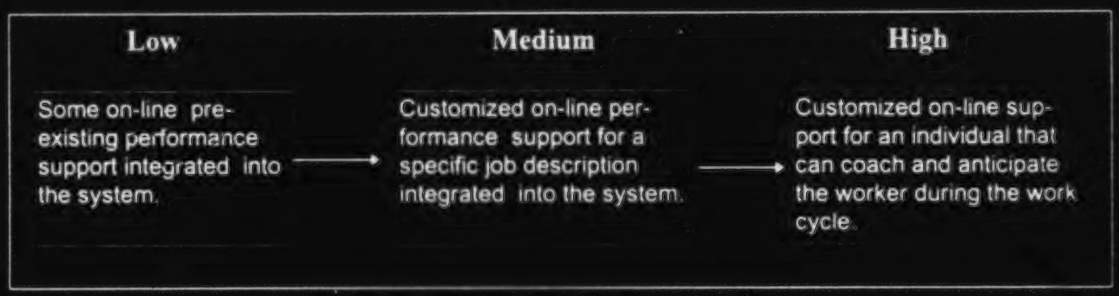
Building an EPSS: Level of Support

Another consideration is whether you will build an integrated performance support system from scratch or a non-integrated performance support system wrapped around an existing application.

Do not take the level of support for granted. For example, if you are building a support system for accountants and you are providing automated tax form completion tools, the development time and cost is significantly different for each level. Will the tool be an off-the-shelf (low) representation, a company customized form for all accountants (medium) or is this an intelligent expert system form

that knows the individual accountant's training, background, and areas on the form where the most support is needed (high). You will also need to negotiate the level of support the system will provide. Figure 1 shows the three levels of increasing support.

Figure 1


Low
Medium
High
Some on-line pre-existing performance support integrated into the system.
Customized on-line performance support for a specific job description integrated into the system.
Customized on-line support for an individual that can coach and anticipate the worker during the work cycle.

The Methodology

(Refer to Figure 2 on the last page)

STEP 1-Marketing your EPSS

As quoted from the Disney organization: "Do the right thing to the right people at the right time." Marketing your idea for an EPSS to your organization needs to be the right thing for the right people at the right time. We suggest using our POW' concept to convince your employer. Remember to target performance, profit and productivity for convincing an employer of the need for an EPSS.

- **The Right Thing** - Is performance at a stand-still? Are there software applications that cause more errors or work than before their introduction? Do a preliminary evaluation of the situation and decide if an EPSS, a tool, or nothing is the "right" thing to pursue now.
- **The Right People** - You must have buy-in from the top down. The success of your project will be based on who will sponsor you, how long they will sponsor you and for how much.
- **The Right Time** - Are the company's profits starting to decline? Is the competition taking more and more business away? Does the corporate culture support the type of undertaking you're going to suggest? Is productivity suffering because of increased bureaucracy and workload? Is performance starting to steadily decrease with more and more dissatisfaction?

STEP 2-EPSS Planning

Clearly define the client's roles and responsibilities and participation. Establish a project team that includes client personnel.

- **Establish Project Scope** - Confirm that the project objectives parallel the client's corporate training strategy and business objectives. Also confirm the EPSS strategy, timelines, and milestones.

- **Examine Organization Goals And Needs** - Review the client's business goals, strategies, and plans and review the current EPSS plans to ensure that they are in line with the business goals, strategies, and plans.
- **Establish Project Team** - Ensure the entire project team fully understands the business reasons for building an EPSS.
- **Establish Time , Reporting, and QA Procedures** - Have the project team agree on an approach to tracking progress and reporting issues that affect the quality, budget, and timelines. Set specific checkpoints for review and revisions.
- **Determine Bio-factor Change Agents** - What Bio-factors are lacking? How can new ones be implemented and old ones reinforced?

STEP 3-EPSS Specification Analysis

Evaluate the technical feasibility of an EPSS from both a user and technical standpoint. Determine whether EPSS or a PST is an appropriate delivery mechanism. If an EPSS or PST is viable then define the functional and technical requirements for it.

- **Conduct User Feasibility** - Determine the extent to which users will be able and willing to use EPSS. Determine current and future software and hardware needs for the EPSS.
- **Conduct Focus Groups** - Determine how EPSS will affect your user population. Ask participants to review EPSS design documentation and assess how EPSS will affect current jobs. Include Bio-factor Change Agents in your focus group discussions.
- **Job Analysis/Task Analysis** - Determine the extent of job performance discrepancies and potential performance improvements and their impact on work, productivity, and profit (Conduct a Cost-Benefit Analysis).
- **Develop Functional Specifications** - Establish support components and match business objectives to components. Compare EPSS components (training, knowledge, reference, advice) to key business objectives. Define the functions and features required for each performance support component based on the performance analysis and determine the support strategy.
- **Develop Technical Specifications** - Define the technical hardware and software requirements for implementing the functions and features outlined in the functional specification.
- **Identify Existing Off-The-Shelf Software And Custom Software Development Requirements** - Identify general-purpose tools to meet any support component needs for common, day-to-day tasks like creating graphics, presentations, and reports. Identify any custom software and their requirements.

STEP 4-Present Findings- Decision Point

Present the analysis method used to justify your recommended solution to give the client sufficient information to either support or reject your conclusions. Present the alternative support methods, pros and cons of each, and a process for ranking the options. If the decision is to proceed with an EPSS then continue by getting your clients approval.

- **Summarize Findings** - Prepare a report that summarizes your findings concerning the technical and user feasibility of EPSS. The best solution could represent a combination of on-line and off-line functions, such as traditional classroom training, on-line procedures, and paper-based job aids and keyboard templates.
- **Present Findings** -Present the analysis used to justify your recommended solution to give the client sufficient information to either support or reject (with a sign-off) your conclusions.
- **Present Alternative Specifications** - Present the alternative support methods, pros and cons of each, and a process for ranking the options.

STEP 5-Develop Maintenance Strategy

The maintenance of an EPSS can be a significant task and must be done for the performance aspect of the EPSS to remain valid. Work with your client to identify the changes and updates that will be necessary to the data-intensive components by identifying how frequently data changes, by anticipating maintenance efforts and costs, and prepare the client to become self-sufficient in maintaining the EPSS components

- **Define Ongoing Maintenance Requirements** - Work with the EPSS technical team to determine procedures for continuing support.
- **Document Maintenance Plan** - Capture findings in a plan that shows an estimated time line for updates and frequency of those updates. Projections and assumptions will be made to determine the impact that maintaining the EPSS will have.
- **Develop Skill Requirements** - Assign maintenance tasks to appropriate client maintenance team members. Work with the maintenance team to define general training requirements based on current knowledge and skills.
- **Estimate Maintenance Costs** - Help the maintenance team members estimate the annual cost of maintaining the EPSS according to work effort (payroll cost), software licensing, hardware upgrade costs, and new release expenses.

STEP 6-Prepare EPSS Development Plan

Create a development plan for the EPSS from assessment through maintenance (Steps 2-10). Keep in mind that EPSS development is thus far a strategy for improving work force performance.

- **Prepare the EPSS Development Plan** - Write a plan that will guide your EPSS team and the client through the development of an EPSS using the major tasks in Step 7 - Build EPSS. Plan must include a set schedule with milestones and client sign-off points as well as a quality audit process.
- **Client Approval And Sign-Off** - Have client review and sign-off on the plan.

STEP 7-Build EPSS

Fully develop the performance support master shell then develop components. Work with subject matter experts to develop the knowledge-base, on-line reference/help information and integrated training sections. General-purpose tools will be identified, evaluated, and selected.

The metaphor for the desktop, graphical user interface, data structure, and data base model will be developed. Hand off the master shell to developers to produce all components.

- **Design And Prototype** - Design the specific performance support components identified. Expert systems (knowledge base and case-based advisory facilities) should provide customized advice and guidance in performing tasks such as problem solving, decision making, and troubleshooting. Reference and help facilities should provide context sensitive information for content incorporating information from internal and/or external data bases. Training should be context sensitive and should provide tutoring, simulation, and coaching strategies for building the skills required for a given job performance. Develop the graphical user interface and the desktop metaphor keeping in mind that this will establish the overall functional and technical architecture of the system. Develop a working demo that conveys the functionality and technical requirements of the design. Get a sign-off from client.
- **Content Procurement** - Work with subject matter experts to develop the knowledge-base, on-line reference and help information and integrated training. General-purpose tools are identified, evaluated, and selected. Gather additional content needed such as manuals and databases for populating the system.
- **Programming And Production** - Produce the various hypermedia components including text, graphics, images, audio, and video and perform the programming functions using an integrated development systems. Develop custom-built programs for special functional or technical requirements. Develop the master programming shell.
- **Component Development** - Develop the support components from the design and integrate the content and automated templates and tools into the master shell.
- **Integration** -Integrate the content and the various performance support components with the system applications (if appropriate). Link, program, test, and debug the EPSS components with existing applications such as product inventory systems; word processing or spreadsheet packages; local area networks.
- **Formative Evaluation** - Beta test the EPSS system and make any fixes required.
- **Demonstration And Sign-Off** - Show the working system to the client and get their approval and sign-off.

STEP 8-Implementation

Install the system according to technical specifications and software specifications in a planned manner to all client locations.

STEP 9-Evaluation

Examine the effectiveness of the EPSS components through a systematic validation process including Bio-factor Change Agents. Assess whether the performance support components are functioning as designed to support the employee.

- **Conduct Performance Reviews Of The Success Of The EPSS-** Ensure the successful implementation and use of the Electronic Performance Support System within the organization.

Gather user feedback using follow-up evaluation procedures designed to assess the performance improvements after the implementation of EPSS.

STEP 10-Maintenance Of The EPSS And Bio-Factor Change Agents

Ensure the successful implementation and adoption of the Electronic Performance Support System throughout the organization. Based on the evaluation results, enhancements and updates are made to the appropriate EPSS component or components. In addition, the appropriate personnel for maintaining the EPSS are identified, trained, and deployed. Maintaining the Bio-factor Change Agents is critical during the maintenance phase to keep performance and productivity up while limiting the dehumanizing effect of the EPSS.

- **Ensure Adequate Maintenance** - Make enhancements and updates based on the evaluation results. Support and train the appropriate people responsible for maintaining the EPSS.
- **Ensure Adequate Bio-Factors** - During the maintenance phase Bio-factors must be maintained and considered by a group of people who have been trained to look for the need and lack of appropriate Bio-factors in the work environment.

Figure 2

The Des Jardins-Davis EPSS Development Model